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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/708,229 | 02/18/2004 | Chih-Yueh Lo | 7804-US-PA | 2228 |

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JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE
7 FLOOR-1, NO. 100
ROOSEVELT ROAD, SECTION 2
TAIPEI, 100
TAIWAN

EXAMINER

PIZIALI, JEFFREY J

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2629

DATE MAILED: 09/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/708,229 | LO ET AL. | |
| | Examiner | Art Unit | |
| | Jeff Piziali | 2629 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☒ Claim(s) 1-6 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 February 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2. Applicants are reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

3. The abstract of the disclosure is objected to because:

Line 1 should be changed from, "*The present invention also provides a line inversion drive circuit*" to simply "*A line inversion drive circuit*";

Lines 6-7 should be changed from, "*the data inversion circuit responsive*" to "*the data inversion circuit **which is responsive***";

Line 10 should be changed from, "*the data line driver responsive the*" to "*the data line driver is responsive **to the***"; and

Lines 13-14 should be changed from, "*The present invention uses a single group of reference voltages only for both non-inverse and inverse data signals*" to "*A single group of reference voltages **is used** only for both non-inverse and inverse data signals.*"

Correction is required. See MPEP § 608.01(b).

4. The disclosure is objected to because of the following informalities:

Page 1, paragraph 3, lines 1-4 should be changed from "*This invention generally relates to a drive device for thin film transistor ("TFT") liquid crystal display ("LCD"), and more particularly to a line inversion drive device for thin film transistor liquid crystal display*" to "*This invention generally relates to a drive device for **a** thin film transistor ("TFT") liquid crystal display ("LCD"), and more particularly to a line inversion drive device for **a** thin film transistor liquid crystal display.*"

Page 2, paragraph 6, lines 1-2 should be changed from "*LCD display has been used in electronic calculators and watches in 1970s. As the technology advances*" to "*LCD displays **have** been used in electronic calculators and watches **since the** 1970s. As the technology advanced.*"

Page 2, paragraph 6, line 8 should be changed from "*CRT LCD display products*" to simply "*CRT display products.*"

Page 2, paragraph 7, line 1 should be changed from "*adopt line inversion*" to "*adopt **a** line inversion.*"

Page 2, paragraph 7, line 6 should be changed from "*LCD display's clock*" to "***An LCD's** clock.*"

Art Unit: 2629

Page 2, paragraph 7, line 11 should be changed from "*Data drive device 110 coupled to a LCD display*" to "*Data drive device 110 is coupled to **an** LCD display.*"

Page 3, paragraph 9, line 6 should be changed, to add a space, from " ΔV_5 , and ΔV_6 " to " ΔV_5 , and ΔV_6 ."

Page 4, paragraph 10, line 9 should be changed from "*LCD display 112 displays*" to "*LCD display 112 **to display.***"

Page 4, paragraph 11, line 2 should be changed from "*LCD display*" to "***an** LCD display.*"

Page 4, paragraph 11, line 4 should be changed from "*LCD display*" to "***an** LCD display.*"

Page 4, paragraph 12, line 2 should be changed from "*TFT-LCD display*" to "***a** TFT-LCD display.*"

Page 5, paragraph 13, line 2 should be changed from "*TFT-LCD display*" to "***a** TFT-LCD display.*"

Page 5, paragraph 13, line 6 should be changed from "*then output*" to "*then outputs.*"

Page 5, paragraph 14, line 7 should be changed from, "*the data inversion circuit responsive*" to "*the data inversion circuit **which is responsive.***"

Page 5, paragraph 14, lines 11-12 should be changed from, "*the data line driver responsive the*" to "*the data line driver **is responsive to the.***"

Page 7, paragraph 24, line 2 should be changed from "*to transmission-type*" to "***to a** transmission-type.*"

Page 7, paragraph 24, line 7 should be changed from "*performs Gamma*" to simply "***perform** Gamma.*"

Page 8, paragraph 24, line 15 should be changed from "*the display have to be transmission*" to "*the display **has** to be **a** transmission*."

Page 8, paragraph 25, lines 13-14 should be changed from "*604 responsive to the display signal and the reference voltages drives*" to "*604, responsive to the display signal and the reference voltages, drives*."

Page 9, paragraph 28, line 6 should be changed from "*Then The LCD display clock*" to "*Then **the** LCD clock*."

Page 10, paragraph 29, line 7 should be changed from "*LCD display's*" to "***the** LCD display's*."

Page 10, paragraph 29, line 17 should be changed from "*is to driving*" to "*is **for** driving*."

Page 11, paragraph 31, line 6 should be changed from "*is only single group*" to "*is only **a** single group*."

Appropriate correction is required.

5. The disclosure is objected to because of the following informalities: The specification is replete with the redundant term, "*LCD display*." The examiner respectfully notes that "LCD" stands for "liquid crystal display." Therefore, appending "LCD" with a yet another "display" is unnecessary.

The specification has not been checked to the extent necessary to determine the presence of all possible redundant "*LCD display*" terms throughout the specification; and an artisan would understand the general gist of what the application is attempting to express. However, the applicants are respectfully requested to inspect the specification for the presence of these

redundant terms, and to make the necessary corrections accordingly. Applicants' cooperation is requested in correcting any other errors of which applicants may become aware in the specification as well.

Drawings

6. Figures 2, 3a, and 3b should be designated by a legend such as --Prior Art-- because only that which is old is illustrated (see Page 3, Paragraphs 8 & 9 of the instant specification). See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

7. The drawings are objected to because:

Figure 2 does not illustrate the reference voltages [$V_{ref1}(+)$, $V_{ref2}(+)$, $V_{ref3}(+)$, $V_{ref4}(+)$, and $V_{ref5}(+)$] said by the specification to be "*shown*" in this figure (see Page 3, Paragraph 8, Lines 5-7 of the instant specification).

Reference numeral 602 in Figure 5 should be changed from "*clock circuit control*" to "*clock control circuit*" (see Page 8, Paragraph 25 of the instant specification).

Reference voltages in Figure 5 appear to range from " V_{ref0} " to " V_{ref1} " and then oddly back to " V_{ref0} " again. The applicants are respectfully encouraged to make sure whether the

second/bottom " V_{ref0} " in Figure 5 shouldn't perhaps be changed to " V_{ref5} ", so as to more closely mirror the reference voltages earlier illustrated in Figure 1.

Step S100 in Figure 6 should be changed from "*receive a data signal and a group of reference voltage*" to "*receive a data signal and a group of reference voltages*" (see Page 10, Paragraph 29 of the instant specification).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

8. Claim 1 is objected to because of the following informalities: Lines 5-6 should be changed from "*data inversion circuit responsive to an inversion control signal determining*" to

Art Unit: 2629

"*data inversion circuit, responsive to an inversion control signal, determining.*" Appropriate correction is required.

9. Claim 2 is objected to because of the following informalities: Lines 11-12 should be changed from "*driver responsive said group of reference voltages and said display signal driving*" to "*driver, responsive to said group of reference voltages and said display signal, driving.*" Appropriate correction is required.

10. Claim 3 is objected to because of the following informalities: Lines 2-3 should be changed from "*said data inversion circuit further comprises*" to "*said data **line driver** further comprises.*" Appropriate correction is required.

11. Claim 4 is objected to because of the following informalities:

Lines 7-8 should be changed from "*said data inversion circuit responsive to said inversion control signal outputting a display signal*" to "*said data inversion circuit, responsive to said inversion control signal, outputting a display signal.*"

Lines 11-12 should be changed from "*driver responsive said group of reference voltages and said display signal driving a plurality of data lines*" to "*driver, responsive to said group of reference voltages and said display signal, driving a plurality of data lines.*"

Line 13 need only end with a single period.

Appropriate correction is required.

Art Unit: 2629

12. Claim 5 is objected to because of the following informalities: Lines 7-8 should be changed from "*said data inversion circuit responsive to said inversion control signal outputting a display signal*" to "*said data inversion circuit, responsive to said inversion control signal, outputting a display signal.*" Appropriate correction is required.

13. Claim 6 is objected to because of the following informalities: Lines 6-7 should be changed from "*determining whether to invert said input signal responsive to an inversion control signal and output a display*" to "*determining whether to invert said input signal, responsive to an inversion control signal, and output a display.*" Appropriate correction is required.

Claim Rejections - 35 USC § 102

14. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

15. Claims 1-7 are rejected under 35 U.S.C. 102(e) as being anticipated by Hashimoto (US 7,046,223 B2).

Regarding claim 1, Hashimoto discloses a line inversion drive device [Fig. 1; circuits 32 and 50 operating in conjunction] (see Column 13, Lines 23-25) for a thin film transistor liquid crystal display [Figs. 1 & 20; 1] (see Column 1, Lines 25-27 & Column 15, Lines 55-58), embedded in (i.e., integrally incorporated with) a clock [Fig. 1; e.g., DCLK, STH, & STV are all

Art Unit: 2629

clock signals] controller [Fig. 1; circuits 6, 32, & 50 operating in conjunction], comprising: a data inversion circuit [Fig. 2; circuits 33, 35, & 37 operating in conjunction] for receiving a data signal [Fig. 2; POL], said data inversion circuit, responsive to an inversion control signal [Fig. 2; STB, which is itself further responsive to Fig. 1's signal S_H] (see Column 1, Line 59 - Column 2, Line 14), determining whether to invert [Fig. 7; S_{SWN} -- wherein it is noted S_{SWN} is an polarity inverted version of signal POL] said data signal (see again Fig. 7; wherein it is further noted that signal POL itself alternates/inverts in polarity in synchronism with pulse STB) and outputting a display signal [Fig. 4; V₁₋₆₄] (see Column 19, Lines 8-39).

Regarding claim 2, Hashimoto discloses a line inversion drive circuit [Fig. 1; circuits 32 and 50 operating in conjunction] (see Column 13, Lines 23-25) for a thin film transistor liquid crystal display [Figs. 1 & 20; 1] (see Column 1, Lines 25-27 & Column 15, Lines 55-58), comprising: a clock [Fig. 1; e.g., DCLK, STH, & STV are all clock signals] controller [Fig. 1; circuits 6, 32, & 50 operating in conjunction] including a data inversion circuit [Fig. 2; circuits 33, 35, & 37 operating in conjunction] for receiving a data signal [Fig. 2; POL] and a clock control device [Fig. 1; 50], said data inversion circuit being coupled to said clock control device (see Figs 1 & 2), said data inversion circuit responsive to an inversion control signal [Fig. 2; STB, which is itself further responsive to Fig. 1's signal S_H] (see Column 1, Line 59 - Column 2, Line 14) determining whether to invert [Fig. 7; S_{SWN} -- wherein it is noted S_{SWN} is an polarity inverted version of signal POL] said data signal (see again Fig. 7; wherein it is further noted that signal POL itself alternates/inverts in polarity in synchronism with pulse STB) and outputting a display signal [Fig. 4; V₁₋₆₄] (see Column 19, Lines 8-39); and a data line driver [Fig. 2; circuits

Art Unit: 2629

19 & 35-37 operating in conjunction], coupled to said data inversion device, for receiving a group of reference voltages [Figs. 2 & 4; $V_{11}\sim V_{15}$] (see Column 18, Lines 21-50), said data line driver, responsive said group of reference voltages and said display signal, driving a plurality of data lines [Fig. 2; $S_1\sim S_{528}$] of said thin film transistor liquid crystal display (see Column 21, Lines 42-51).

Regarding claim 3, Hashimoto discloses a Gamma compensation circuit [Fig. 4; 35 and Fig. 5; 19] coupled to said data inversion circuit to compensate (via both the "variation correcting mode" and the amplification circuitry) said display signal (see Column 2, Lines 56-60; Column 18, Lines 21-50; and Column 19, Line 40 - Column 20, Line 24).

Regarding claim 4, Hashimoto discloses a line inversion drive circuit [Fig. 1; circuits 32 and 50 operating in conjunction] (see Column 13, Lines 23-25) for a thin film transistor liquid crystal display [Figs. 1 & 20; 1] (see Column 1, Lines 25-27 & Column 15, Lines 55-58), comprising: a data inversion circuit [Fig. 2; circuits 33, 35, & 37 operating in conjunction] for receiving a data signal [Fig. 2; POL]; a clock [Fig. 1; e.g., DCLK, STH, & STV are all clock signals] controller [Fig. 1; circuits 6, 32, & 50 operating in conjunction], coupled to said data inversion circuit, for generating an inversion control signal [Fig. 2; STB, which is itself generated via Fig. 1's signal S_H] (see Column 1, Line 59 - Column 2, Line 14) to said data inversion circuit to determine whether to invert [Fig. 7; S_{SWN} -- wherein it is noted S_{SWN} is an polarity inverted version of signal POL] said data signal (see again Fig. 7; wherein it is further noted that signal POL itself alternates/inverts in polarity in synchronism with pulse STB), said

Art Unit: 2629

data inversion circuit responsive to said inversion control signal outputting a display signal [Fig. 4; V₁₋₆₄] (see Column 19, Lines 8-39); and a data line driver [Fig. 2; circuits 19 & 35-37 operating in conjunction], coupled to said data inversion circuit, for receiving a group of reference voltages [Figs. 2 & 4; V₁₁~V₁₅] (see Column 18, Lines 21-50), said data line driver, responsive said group of reference voltages and said display signal, driving a plurality of data lines [Fig. 2; S₁-S₅₂₈] of said thin film transistor liquid crystal display (see Column 21, Lines 42-51).

Regarding claim 5, Hashimoto discloses a line inversion drive device [Fig. 1; circuits 32 and 50 operating in conjunction] (see Column 13, Lines 23-25) for a thin film transistor liquid crystal display [Figs. 1 & 20; 1] (see Column 1, Lines 25-27 & Column 15, Lines 55-58), comprising: a data inversion circuit [Fig. 2; circuits 33, 35, & 37 operating in conjunction] for receiving a data signal [Fig. 2; POL]; and a clock [Fig. 1; e.g., DCLK, STH, & STV are all clock signals] controller [Fig. 1; circuits 6, 32, & 50 operating in conjunction], coupled to said data inversion circuit, for generating an inversion control signal [Fig. 2; STB, which is itself generated via Fig. 1's signal S_H] (see Column 1, Line 59 - Column 2, Line 14) to said data inversion circuit to determine whether to invert [Fig. 7; S_{SWN} -- wherein it is noted S_{SWN} is an polarity inverted version of signal POL] said data signal (see again Fig. 7; wherein it is further noted that signal POL itself alternates/inverts in polarity in synchronism with pulse STB), said data inversion circuit, responsive to said inversion control signal, outputting a display signal [Fig. 4; V₁₋₆₄] (see Column 19, Lines 8-39).

Regarding claim 6, Hashimoto discloses a line inversion drive method [Fig. 1; via circuits 32 and 50 operating in conjunction] (see Column 13, Lines 23-25) for a thin film transistor liquid crystal display [Figs. 1 & 20; 1] (see Column 1, Lines 25-27 & Column 15, Lines 55-58) to drive a plurality of data lines [Fig. 2; S₁-S₅₂₈], comprising the steps of: receiving an input signal [Fig. 2; POL] and a group of reference voltages [Figs. 2 & 4; V₁₁~V₁₅] (see Column 18, Lines 21-50); determining whether to invert [Fig. 7; S_{SWN} -- wherein it is noted S_{SWN} is an polarity inverted version of signal POL] said input signal (see again Fig. 7; wherein it is further noted that signal POL itself alternates/inverts in polarity in synchronism with pulse STB), responsive to an inversion control signal [Fig. 2; STB, which is itself responsive to Fig. 1's signal S_H] (see Column 1, Line 59 - Column 2, Line 14), and output a display signal [Fig. 4; V₁₋₆₄] (see Column 19, Lines 8-39); compensating [via Fig. 4; 35 and Fig. 5; 19] said display signal; and driving said plurality of data lines responsive (via both the "variation correcting mode" and the amplification circuitry) to said compensated display signal and said group of reference voltages (see Column 2, Lines 56-60; Column 18, Lines 21-50; and Column 19, Line 40 - Column 20, Line 24).

Regarding claim 7, Hashimoto discloses said step of compensating said display signal is performed by Gamma compensation (see Column 2, Lines 56-60).

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure. Maeda et al (US 2003/0156086 A1), Song et al (US 2003/0151584 A1), Chang et al (US 2003/0142084 A1), Bu (US 2003/0122754 A1), Kato (US 2002/0126112 A1), Kang et al (US 2002/0063666 A1), Sakaguchi et al (US 7,075,505 B2), Sugawara et al (US 7,006,065 B1), Yamaguchi et al (US 6,987,499 B2), Kang et al (US 6,963,328 B2), Bu (US 6,836,232 B2), Sakaguchi et al (US 6,806,861 B1), Yer et al (US 6,731,259 B2), Liaw et al (US 6,593,934 B1), Naito (US 6,462,735 B2), Chiang (US 6,271,822 B1), Tamai et al (US 6,160,533 A), and Kim (US 5,796,384 A) are cited to further evidence the state of the art pertaining to line inversion drive circuitry.

Art Unit: 2629

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff Piziali whose telephone number is (571) 272-7678. The examiner can normally be reached on Monday - Friday (6:30AM - 3PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on (571) 272-7681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read 'JPiziali', is written above the printed name.

Jeff Piziali
6 September 2006